

# Enhanced Mission-Enabling Ultra-High Power Solar Array (Mega-ROSA EX), Phase I

Completed Technology Project (2012 - 2012)



## Project Introduction

Mega-ROSA-EX is an enhanced, higher stiffness, higher sun-pointing accuracy, higher strength, higher specific power and even larger overall power / deployed size / stowed packaging capability configuration of the innovative Mega-ROSA technology. Mega-ROSA, named for Mega Roll-Out Solar Array, is a highly-modularized and extremely-scalable ROSA-based solar array architecture that provides immense power level range capability from 100kW to multiple Megawatts in size, for NASA Exploration Initiative and Planetary missions such as SEP space-tug and large-scale SEP-powered Planetary applications. The further-advanced/optimized versions of Mega-ROSA proposed(Mega-ROSA EX),promise to increase its deployed stiffness, strength and deployed size/packaging capability performance well beyond the excellent values already shown to be obtainable with the baseline "standard" high-packaging efficiency Mega-ROSA design. The significant and revolutionary end-user benefits of the Mega-ROSA EX technology advances are: Increased deployed stiffness / sun-pointing accuracy - The Mega-ROSA-EX configurations proposed to be developed during the Phase 1 program will allow significantly higher deployed stiffness (3-5 times higher than the standard baseline Mega-ROSA configurations), and the resulting lower PV blanket-plane displacements / higher wing sun-pointing accuracy achieved under expected on-orbit accelerations will enable the use of currently-available and cost-lowering flex-blanket PV concentration systems. The use of these concentrating methods to reduce the amount of expensive high-performance photovoltaics is a necessity to make cost-viable many of the planned NASA high-power SEP and Planetary missions. Certain SEP-powered Tug and Planetary spacecraft applications have mission scenarios with burn events/maneuvers that impose high accelerations. The Mega-ROSA EX configurations proposed are capable of achieving these accels. up to 0.25 G's and higher.



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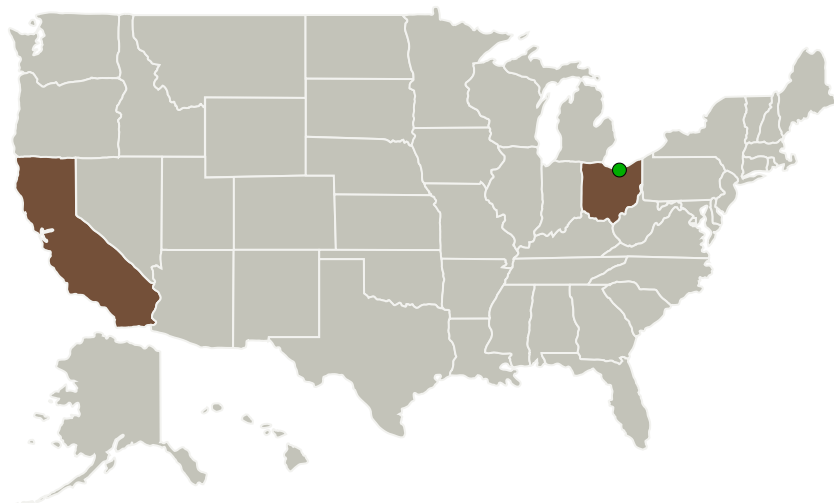
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## Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
Deployable Space Systems, Inc(DSS)	Lead Organization	Industry	Goleta, California
● Glenn Research Center(GRC)	Supporting Organization	NASA Center	Cleveland, Ohio

## Primary U.S. Work Locations

California	Ohio
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## Project Transitions

▶ **February 2012:** Project Start

✓ **August 2012:** Closed out

## Closeout Documentation:

- Final Summary Chart(<https://techport.nasa.gov/file/138136>)

## Organizational Responsibility

## Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

## Lead Organization:

Deployable Space Systems, Inc (DSS)

## Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

## Project Management

## Program Director:

Jason L Kessler

## Program Manager:

Carlos Torrez

## Principal Investigator:

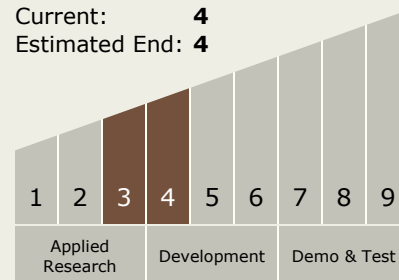
Steve White

## Technology Maturity (TRL)

Start: **3**

Current: **4**

Estimated End: **4**



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## Technology Areas

### Primary:

- TX03 Aerospace Power and Energy Storage
  - └ TX03.1 Power Generation and Energy Conversion
    - └ TX03.1.1 Photovoltaic

## Target Destinations

Earth, The Moon, Others Inside the Solar System, Outside the Solar System, The Sun, Mars